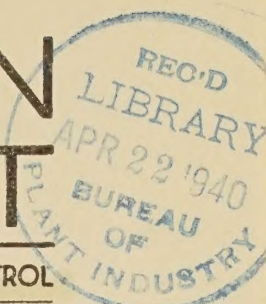


THE • EXTENSION PATHOLOGIST

A NEWS LETTER FOR EXTENSION WORKERS INTERESTED IN PLANT DISEASE CONTROL



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VEGETABLE SEED TREATMENT

For several years the vegetable-seed-treatment program has required much time of the extension specialist, and has received as much favorable comment from farmers as any help which our Department has been able to offer.

Seed treatments have been of various kinds, and have been encouraged by:

1. Visiting canners and seed companies and helping them to plan the required apparatus or inspecting the machinery already set up.
2. Personally treating seed either at the canning factory, seed house, or at the college where many kinds of seeds are sent by farm bureaus, seed companies, or individuals for treatment.
3. Holding an all-day seed-treating clinic in a given county. A place is chosen where there is plenty of room and where hot water is available. The county agricultural agent provides the necessary materials. The farmers then come at any time of the day to have vegetable seeds treated, to hear a discussion of the reasons for treating, and to practice treating for themselves.
4. In cooperation with the Farm Bureau, holding method demonstrations in various parts of the county.

In all this seed-treatment work, Dr. James G. Horsfall of Geneva has been of great help. He has done most of the pea-seed treating in the State. In 1937 approximately 90,000 bushels of cannery peas were treated with red cuprous oxide. In 1938, the amount had increased to 110,000 bushels. In addition, probably 10,000 bushels of market peas were treated. This is sufficient seed to plant two-thirds of the State pea acreage.

Cabbage, cauliflower, and brussels-sprouts seeds are now almost all treated with hot water. The extension specialist personally treated seeds in Delaware, Schenectady, Albany, Ontario, Niagara, Wayne, and Erie Counties. The Farm Bureaus in Suffolk, Nassau, Monroe, and Genesee Counties operated treating vats. Suffolk treated almost 1,500 pounds, and Nassau, 746 pounds. In addition, a number of seed companies treated all the seed they sold or distributed.

It was interesting to the extension specialist while traveling in Denmark to find that two seed companies, which furnish much of the New York imported seed, had installed hot-water treating vats and had treated cabbage and cauliflower seed according to the directions given out by the New York State College of Agriculture. Among seven countries visited, only three countries - England, Denmark, and Holland - seemed actively engaged in combating vegetable diseases. In each of these countries the extension specialist was shown Cornell Extension Bulletin 206, as being considered an up-to-date source for practical control measures.

Two demonstration plots were conducted showing the effects of various treatments on tomato seed. Some were treated with hot water (122° F. for 20 minutes), some with acetic acid (according to Dr. Blood's recommendations in Utah), Ceresan (as requested by Georgia State Station), and corrosive sublimate (1-3000 for 10 minutes). No diseases, excepting *Macrosporium* leaf blight, were present, so that none of the treated plots were better than the check plots. They did show that the various treatments caused little or no injury to the seed. The treated seed, particularly that treated with corrosive sublimate, was slightly slower in coming up.

--Annual Report, 1938, New York
Extension Plant Pathology

WORK WITH CANNERS

The tenth annual Wisconsin canners' short course was held at the University of Wisconsin College of Agriculture, March 23 to 25, 1938. A program committee from the college met with a committee of the Canners' Association and laid out the subjects it was desired to have discussed. R. E. Vaughan was designated as director and arranged the program. The enrollment was 209 as against 91 in 1937 and 147 in 1936. Canners were represented from 35 Wisconsin counties and 14 other States, and 27 commercial supply men registered from 17 States. There were 19 college of agriculture staff members who contributed to the success of the program. The canners are so much pleased with the course that they want a similar session in 1939.

Summer demonstration tours were held with a number of canning companies for observations on beet internal spot, pea root rot and wilt, and corn diseases, especially smut and root rot in hybrid sweet corn. The corn and pea demonstrations were tied in with those of the agronomy department under Professors Neal and Delwiche. Dr. Walker's work on boron deficiency was presented at the Canners' Association meeting in November and published in November Canning Age.

--R. E. Vaughan, extension plant
pathologist, Wisconsin. Annual
Report 1938.

CALIFORNIA TOMATO DISEASE PROBLEMS

Plant diseases are a controlling factor in tomato production in California. The diseases are largely seed, soil, and insect-borne. Foliage diseases are important only in the late fall shipping districts where late blight appears intermittently. Satisfactory progress has been made in bacterial canker control. Through field meetings and other publicity, the recommendations on seed treatment have been widely disseminated. In California the practice of topping plants in the coldframe has been responsible for the most serious losses. This is a serious factor, because seed treatment is only partly effective. County agents report a marked reduction in canker since these factors have been emphasized.

In Ventura County, tomato yields invariably decline seriously after the land has been used for two or three crops. Detailed surveys by the county agent and the plant pathology specialist, supplemented by extensive laboratory cultures, revealed that *Verticillium* wilt is almost entirely responsible. This knowledge is being used as a basis for tomato-variety trials. Incidentally, it was found that this area was relatively free from spotted wilt and other virus diseases. This fact was brought to the attention of the plant breeders as the freedom from virus diseases simplifies the problem of testing for *Verticillium*-wilt resistance. Similar surveys were made in Los Angeles, Orange, and San Diego Counties where the disease picture was found to be more complicated. This is typical of plant-disease problems in California, that is, great variation between districts not widely separated.

--C. E. Scott, extension plant
pathologist, California.
Annual Report, 1938.

WILT-RESISTANT WATERMELONS

Reno County, Kans., reports: "The work on wilt-resistant varieties of watermelons was continued for the second year, demonstrations being located on the farms of W. D. Coleman and Lee Garber. The demonstration on the Coleman farm was fair, but because of late planting did not give conclusive results as to quality and type of melons. The varieties planted were wilt resistant. This was a striking demonstration as the local seed planted in the same plot failed entirely, due to wilt."

The Hawkesbury proved to be a high-quality melon possessing an attractive red center flesh with a thin rind of suitable handling quality that conformed to the space available in the average home ice box. How well this variety will produce and the extent of its market value in Kansas remain largely to be determined, but at present the variety deserves some consideration.

--J. O. Miller, extension plant pathol-
ogist, Kansas. Annual Report, 1938.

CUCUMBER SPRAYING AND DUSTING DEMONSTRATIONS IN PENNSYLVANIA

Control of cucurbit diseases has always been a difficult problem. This is because the standard fungicides which have been recommended in the past, although they give efficient control of the common diseases, also often cause injury to the crop. In the past few years, new materials have been showing considerable promise. This year, 24 spraying and dusting demonstrations were carried out on cucurbits in various parts of the State, involving the use of copper-oxychloride, the most promising of these new materials. Results from these demonstrations showed an increase in yield, due to the use of this material, of 31 percent. Another point of importance was brought out in these demonstrations, namely, that in the western part of the State this material showed profit, but in the southeastern part of the State, where angular leaf spot is the principal problem with the growers, this disease was not controlled. Thus it appears that copper-oxychloride is of definite value in the western part of the State, but that southeastern growers must rely on bordeaux mixture for the present. Another point of importance which was brought out by the demonstrations was that although copper-oxychloride gave good increased yield, nevertheless it is necessary that this practice be used in conjunction with other standard disease-control practices such as seed treatment and crop rotation.

A specific instance showing the value of dusting muskmelons with copper-oxychloride was illustrated on a farm in Erie County. Three-fourths of an acre was planted to melons; one-fourth of an acre was dusted with copper-oxychloride and from this area \$75 worth of melons was sold. One-half acre was sprayed with bordeaux mixture. From that area \$30 worth of melons was sold. This increase was obtained in spite of the fact that the complete stand was killed in mid-August by an uncontrolled outside factor.

--Extension Plant Pathology,
Pennsylvania, Annual Report 1938.

PEA-SEED TREATMENT ENCOURAGING

A pea-seed treatment field test, to demonstrate the value of red copper oxide, New Improved Ceresan and Semesan in establishing stands and increasing yields was conducted in Saguache County, Colo., in 1938, in cooperation with County Extension Agent Frank McGee. The plots were planted so that eight rows of untreated checks alternated between each replication of treated rows. The plantings were made in the grower's drill. A random sample lot of seed was divided into six lots.

Lot 1 was treated with Semesan, at the rate of 4 ounces per 50 pounds of seed.

Lot 2 was treated with New Improved Ceresan at the rate of 1 ounce per 50 pounds of seed.

Lot 3 was treated with Cuprocidate at the rate of 2 ounces per 50 pounds of seed.

Lot 4 was left untreated to be used for checks.

Results

1. The untreated lots showed 71 percent of a normal stand, and yielded 740 pounds of peas.

2. The Semesan treated seed showed 92 percent stand, with a yield of 1,104 pounds. This seed treatment gave a 21 percent increase in stand and 49.2 percent increase in yield.

3. The New Improved Ceresan seed treatment gave a 96 percent stand with a yield of 1,168 pounds. This seed treatment gave a 25 percent increase in stand and 57.8 percent increase in yield.

4. The Cuprocidate seed treatment showed a 93 percent stand with a yield of 1,116 pounds. This seed treatment showed a 22 percent increase in stand and 50.8 percent increase in yield. These data show that significant increases in stand and yield of peas were obtained with each treatment with considerable advantage in favor of New Improved Ceresan. Seed treatment has been adopted by nearly all the growers in Alamosa, Rio Grande, and Costilla Counties.

Mr. McGee states that "Many farmers in the district east from Center treated their seed peas with New Improved Ceresan, and the results were very gratifying."

This district had practically dropped out of production because of the low yields, largely due to root rot and poor stands.

--W. J. Henderson, extension
plant pathologist, Colorado.
Annual Report, 1938.

YELLOWS-RESISTANT CABBAGE SEED SOURCE TEST

Demonstrations of yellows-resistant cabbage were carried on in cooperation with County Agents Ryall, Polley, and Swansen, at Kenosha and Shiocton with selected growers. The need for these summer demonstrations was brought out by the growers who complained that the yellows-resistant varieties were not standing up. Seed of the varieties used in the demonstrations was collected by Mr. Ryall from various seed dealers. Strains

included: Jersey Queen 6; Detroit 3; Golden Acre 2; Copenhagen 6; Racine 2; Marion Market 12; Globe 6; All Head Select 8; Wisconsin All Seasons 9; Wisconsin Ball Head 9; Wisconsin Hollander 13; Bugner 6; Red Hollander 3. These were interplanted with rows of Penn. State Ball Head, a variety very susceptible to yellows.

The results of the demonstration were satisfactory. The plants from some company sources showed very low resistance and had evidently been mixed by lack of adequate care in handling. Fortunately, the companies having such seed sold only a limited amount in yellows-infected areas.

--R. E. Vaughan, extension plant
pathologist, Wisconsin.
Annual Report, 1938.

POTATO SPRAYING GIVES BIG RETURNS
IN PENNSYLVANIA

In 1938 late blight became epidemic in many parts of Pennsylvania where abnormal June and July rainfall occurred. The disease was recognized on June 20, which is the earliest known appearance of this disease in the State. All county agents, and through them the growers, were immediately informed as to its appearance and proper control measures. For the first time a series of four spray information letters was prepared and the letters were sent to the counties where they were used to keep potato growers informed as to the progress of the disease and how, and with what, and when to spray. Individual letters totaling 3,342 were sent to growers.

The potato disease situation was surveyed during the 1938 growing season. Many fields were visited with the county agents. In properly sprayed fields, foliage diseases were at a minimum. Unsprayed fields which were visited had serious losses and many of them were not worth harvesting. It is desirable that this service be continued and even more time be devoted to it so that growers can get the maximum benefit.

Yield averages from result spraying demonstrations showed that potatoes sprayed with 8-8-100 bordeaux mixture yielded 257.8 bushels per acre; unsprayed potatoes in the same demonstrations yielded only 132.7 bushels. Using cost-of-production figures collected by the farm-management group, the sprayed potatoes were produced for 43 cents per bushel as compared with 82 cents on the unsprayed. At the current market price of 80 cents per bushel, the unsprayed potatoes were produced at a loss of 2 cents per bushel; the sprayed provided an income of 37 cents per bushel, or \$2.65 loss as compared to \$94.68 profit. Pennsylvania produced 114,000 acres in 1938, of which one-half (57,000 acres), was sprayed. At the figure of \$94.68 less \$10 for spraying, this meant an increased profit to Pennsylvania growers of \$4,403,360.

Another series of spraying demonstrations where the amount of lime was kept low in the bordeaux mixture (8-4-100) had on the average another 19.4 bushels per acre added, as compared with those sprayed with 8-8-100 bordeaux mixture, thus further lowering cost of producing a bushel of potatoes, and increasing the profit from this farm enterprise. Potato spraying turns potato production from losses to profits. This is especially evident when we consider that in 1918 when disease-control practices were first advocated in Pennsylvania, the average acre yield for the State was 80 bushels and that, after 20 years of extension work in disease control, the average yield has been increased to 114 bushels per acre. This 114 bushel yield per acre is even more significant when we take into consideration that 1937 and 1938 have been 2 years in which late blight has been epidemic in at least part of the State.

In spraying demonstrations in 1936 when late blight was present but not severe, the difference between sprayed and unsprayed was only 70.2 bushels. In 1937 the difference was 110 bushels; in 1938, with late blight even more severe, the difference was 125 bushels. This points out that the 12,000 sprayers in operation in Pennsylvania are really used to advantage by the growers. It may be worth while to note here, however, that the ultimate goal has not been reached in potato-disease control, since there were sufficient numbers of growers spraying either poorly or not at all, to cause a reduction in the total yield. This reduction was due in a large measure to late blight of more than 3,000,000 bushels in 1938. More time must be spent in keeping the foliage disease situation before the growers so that these excessive losses can be prevented and the greatest possible returns derived from each acre planted. Three active spray rings with 73 members were assisted during the year in making their spraying program more effective to the membership.

--Extension Plant Pathology,
Pennsylvania Annual Report 1938.

COTTONSEED TREATMENT: SUPPLEMENTARY NOTE

In my paper, entitled "Cotton Seed Treatment," published in the February issue of The Extension Pathologist, the following sentence occurs (p. 36), "Pathologists in a number of cotton-growing States, notably Mississippi, North Carolina, and South Carolina, began experimenting with dust preparations about 1925 to 1927." Since the publication of this paper, Dr. B. B. Higgins of the Georgia Agricultural Experiment Station has called my attention to the fact that I failed to mention Georgia in the above statement and failed to give due credit to the Georgia station for its early work on seed dusting which, Dr. Higgins says started in a preliminary way as early as 1921.

The omission of Georgia from the sentence quoted was an unintentional oversight, and it is requested that readers insert the name of that

State in their original copies. In the article referred to, the writer was not attempting a detailed review of the early cottonseed dusting work of the several stations, but merely trying to lead up to a statement of the present situation with regard to seed treatment.

--S. G. Lehman

PENNSYLVANIA SEED COMPANY IMPROVES
QUALITY OF SEED GRAIN

By R. S. Kirby,
Extension plant pathologist,
Pennsylvania.

Seed wheat and seed barley cleaned, graded, and treated by
portable machines of a Pennsylvania Seed Company in 1938.

County	Wheat (Bushels)	Barley (Bushels)
Lancaster	27,920	5,048
Lebanon	8,186	1,588
York	7,786	631
Lehigh	7,597	575
Perry	9,536	762
Berks	6,038	497
Dauphin	1,757	221
Northampton	1,193	64
Chester	1,467	244
Cumberland	940	98
Montgomery	673	244
Juniata	62	--
Columbia	10	165
Total	73,165	10,137
Total bushels wheat and barley treated		83,302

OHIO EXTENSION WORK

After taking into consideration the relative value, production, and acreage of crops, the importance of localized and specialized crops, the destructiveness of diseases, and methods of control available, the extension plant pathologist for Ohio has selected the following phases of work for 1939:

1. Fruit disease control.
 - a. Apple scab spray service.
 - b. Effectiveness of various sprays on control of apple scab.
 - c. Peach leaf curl control.
2. Vegetable disease control.
 - a. Spraying and dusting:
 - (1) Cucumbers and melons.
 - (2) Celery.
 - (3) Carrots.
 - (4) Potatoes.
 - (5) Tomatoes.
3. Tobacco disease control.
 - a. Seedbed spraying and treatment for blue mold and wildfire control.
 - b. Control of black root rot by use of resistant varieties.
4. Sugar beet diseases.
5. Cereal seed treatment.
 - a. Seed treating on farm.
 - b. Seed cleaning and treating machines.
6. Diseases of forage crops.
7. Disease surveys, including county agent contacts.
Collection of illustrative material.

Roy H. Milton, tobacco specialist in Tennessee, held 31 tobacco disease control meetings in 20 counties between the dates of February 11 and February 28. A total of 1,246 farmers attended the meetings, an average of 40 per meeting.

COLORADO AGENTS START SORGHUM-SMUT FIGHT WITH PROMISING RESULTS

In cooperation with county extension agents of sorghum-producing counties, meetings were conducted with farmers where the characteristics of kernel smut and its control measures were explained. The Minnesota Seed Grain Treater was also exhibited and explained at these meetings. Plans for construction of seed treaters were furnished to county extension agents and farmers. Elevator men in certain counties cooperated by treating grain at actual cost.

Field tests were conducted to demonstrate the value of New Improved Ceresan as a seed treatment for control of kernel smut. Fifty of these test demonstrations were conducted in 18 counties in 1938, as follows: Douglas-6, Yuma-12, El Paso-3, Pueblo-2, Kiowa-4, Cheyenne-2, Prowers-4, Elbert-6, Adams-1, Arapahoe-1, Boulder-1, Bent-1, Douglas-1, Kit Carson-2, Lincoln-1, Morgan-1, Phillips-1, and Washington-1.

Campaigns were conducted in a number of the counties to encourage farmers to treat their sorghum seed.

Results

It is rather difficult to give an accurate account of the results obtained in this phase of the work because of the lack of time to make a survey in each county. However, judging from the reports made by several county extension agents, seed treatment with organic mercury dust was very successful. Seed treatment was introduced in these counties in the spring of 1938. A resume of the reports, by several county extension agents, will give a fair conception regarding the success of the sorghum-seed-treatment program conducted during the past season.

In a survey of several sorghum fields, planted with untreated seed, Mr. Watson, Pueblo County extension agent, found that the crops were from 5 to 25 percent infected with kernel smut. He reports very few of the farmers in that county treated their seed, and as a result heavy losses were caused by smut. It was his opinion that the excellent results obtained in controlling smut, in the field demonstrational plots, would have a great deal to do with convincing farmers of the need to treat their seed next season.

Mr. Trierweiler, Yuma County extension agent, reports that "For years farmers in the county have been troubled with smut in sorghums." He had 12 field demonstrational tests on seed treatment for control of sorghum smut, and also conducted a successful campaign for adoption of the practice by farmers in general.

He states, "All the men who treated reported excellent results in controlling smut."

Mr. Trierweiler quotes one of his farmers as follows, "I am going to treat all of my seed from now on because it pays.My neighbors who did not treat their sorghum for smut had the normal infestation."

It is the opinion of the extension plant pathologist that such conversation is a good recommendation and also excellent publicity for seed treatment. No doubt he told his neighbors just what one should do to prevent smut.

Mr. Weaver, Kiowa County extension agent, inspected a number of fields that were planted with untreated seed and others planted with

treated seed. He found from 2 to 10 percent smut-infected plants in the untreated crops, and none in those that were treated. Mr. Weaver estimated that approximately 40 farmers were influenced to treat their seed, and that at least 30 of that number had expressed an opinion that it was a paying proposition.

He quotes one of these men as remarking to a group of farmers at a meeting, "Treating seed for smut control is an awfully good habit to get into."

Mr. Skitt, Baca County extension agent, reports that 90 percent of the crops in Baca County for 1938 were some member of the sorghum family. He stressed seed treatment to the growers with the result that many followed his suggestions. Those who treated were convinced that it was a successful control. He states that those who failed to treat suffered heavy losses. Mr. Skitt has been campaigning for seed treatment of sorghum seed for smut control. It was his opinion that of the large acreage that will be planted next season, very little seed will go into the ground untreated. One elevator at Springfield sold over 180 pounds of New Improved Ceresan, and did custom treating to the extent of 75,000 pounds of seed. In addition to that, other stores in Springfield sold 395 pounds of New Improved Ceresan.

Mr. Hodgell, Las Animas County extension agent, estimated that 50 percent of the sorghum in the east section of the county was infected with kernel smut. He plans to conduct a seed-treatment campaign next season.

Mr. Sandhouse, Adams County extension agent, conducted a very successful campaign in the sorghum-producing districts of that county.

He estimated that less than 5 percent of the plants in the sorghum crops that were treated were infected with smut.

He states, "This is a very decided improvement over the seasons of 1936 to 1937."

Mr. Ferguson, county extension agent in Elbert County, reported that the results of the 6 seed-treatment tests he conducted for control of kernel smut were almost identical. He states that control was obtained by the seed treatment, and the untreated was heavily smutted.

Mr. Hoffman, Phillips County extension agent who has had very successful seed-treating campaigns on wheat and corn, conducted an extensive campaign on seed treatment of sorghum for the control of smut.

The success of his efforts can be estimated by his statement, "Drug stores and elevators could not keep the dust (New Improved Ceresan) on hand."

In relating the results of his sorghum-seed-treatment tests, Mr. Harp, Cheyenne County extension agent, reports that one test showed no

difference, in that the seed used was free from smut. However, another test showed that 50 percent of the plants in the untreated stand were infected with kernel smut, while only 5 percent of the plants were infected in the New Improved Ceresan treated stand.

Mr. French, Prowers County extension agent, reports that in a seed-treatment test with New Improved Ceresan only a trace of smut was found in the plants grown from treated seed, while 50 percent of the plants from untreated seed were infected.

He quotes the demonstrator on whose farm the test was conducted as saying, "Never again will a seed go into the ground untreated."

The results obtained by these men certainly warrant attention. It is quite evident that the control measures, recommended by the Extension Service, were satisfactory, and that next season we should make a real effort to stamp out kernel smut of sorghum in the State.

--W. J. Henderson, extension
plant pathologist, Colorado.
Annual Report, 1938.

NEW YORK COUNTY SAFEGUARDS POTATO CROP

Two new spray rings have been formed in Genesee County, N. Y., this year with all the old rings having all the acreage that they can spray, writes County Agent Ralph D. Morgan, May 20. Indications are that there will be approximately 175 to 200 acres more sprayed in the rings this year than last. Judging from the demand for dusters and sprayers at various auctions throughout the county, growers who are not in rings are planning to do more spraying this year. Potato treating is practically completed with only 1 more day's treating of about 1,500 bushels to be done. Up to the present time, approximately 41,000 bushels have been treated, 14,000 bushels for the Orleans County growers, and 27,000 for the Genesee County growers. This is divided nearly equally this year - 14,500 for the muckland and approximately 12,500 for upland. Last year, approximately 34,000 bushels were treated - 14,000 for the Orleans County growers and 20,000 for Genesee County men (13,000 on the muckland and 7,000 on the upland). A big increase this year in potato treating has occurred with upland growers, primarily due to the excellent results received by some of the growers who treated last year.

YELLOWS-RESISTANT CABBAGE USED IN COLORADO

Truck farmers have become aware of the serious nature of cabbage yellows and are anxious to adopt yellows-resistant strains, even on ground where the causal organism does not exist. The latter practice is good, where resistant varieties are adaptable.

In the tests at Adams and Arapahoe Counties, the early Marion Market showed a high degree of resistance, excellent quality and adaptability. It has been used to a large extent for commercial plantings in Weld, Adams, and Arapahoe, as a result of last year's tests. There seems little doubt that this early yellows-resistant variety will ultimately replace all the early yellows-susceptible varieties grown in the State. The yellows-resistant Globe responded well, although a few days later in maturity than desirable.

In the test at Littleton, Arapahoe County, the susceptible check plants died; 95 percent of the early Marion Market and 97 percent of the midseason Globe remained healthy. The same response occurred in the Weld County and Adams County tests.

--W. J. Henderson, extension plant
pathologist, Colorado. Annual
Report, 1938.

DISEASE-RESISTANT OAT VARIETIES

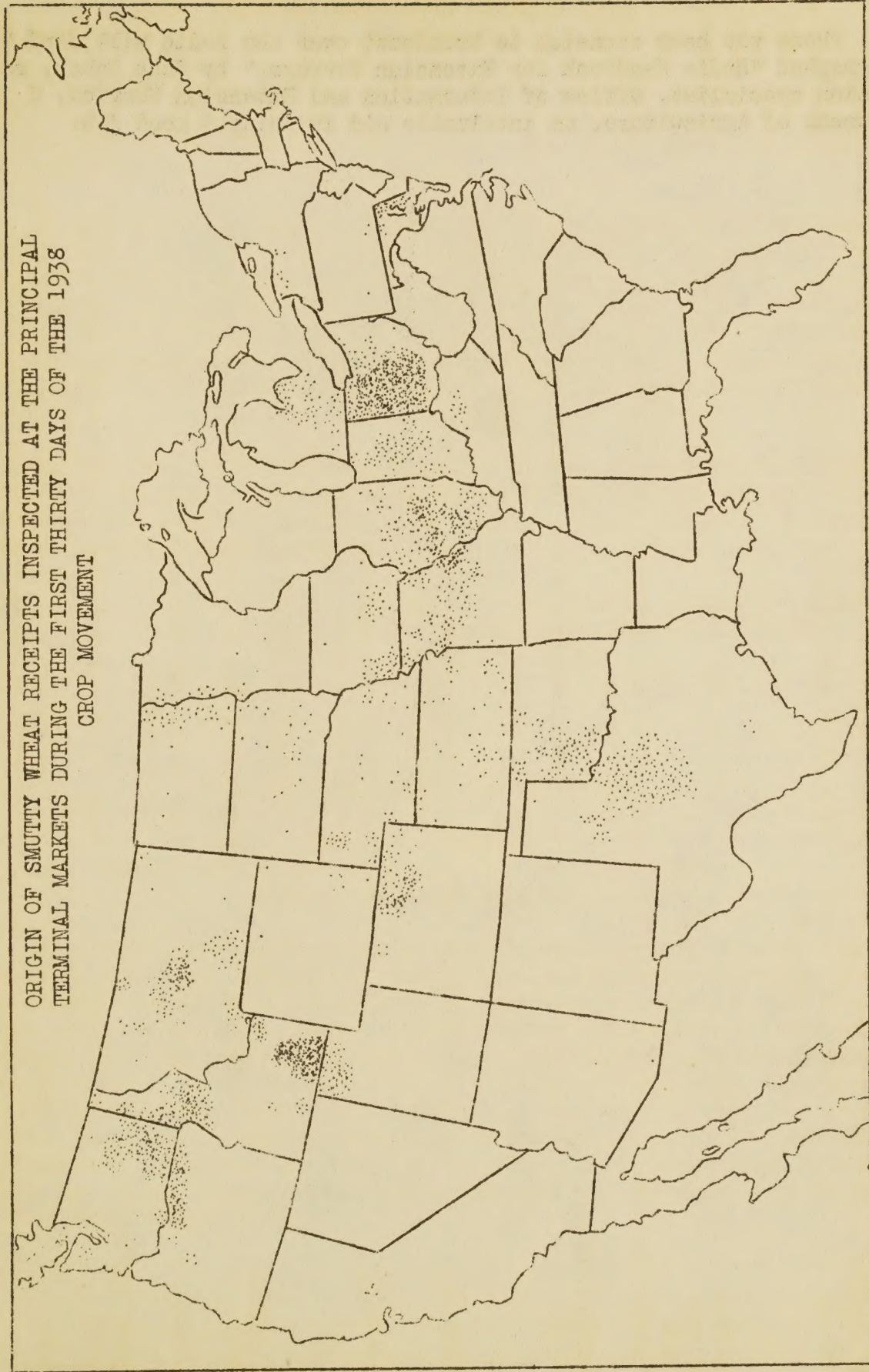
By T. R. Stanton,
Senior agronomist in Charge Oat investigations,
Bureau of Plant Industry

In recent years much progress has been made in the breeding of new disease-resistant oat varieties. With the introduction, in 1927, of varieties highly resistant to crown rust, it has been possible to breed new strains, such as Boone, having a combination of resistance to stem rust, crown rust, and the smuts as shown in the chart below. All the varieties listed on page 71 with the exception of Anthony and Fulgrain, were developed at State agricultural experiment stations in cooperation with the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture. Anthony was bred by the Minnesota Agricultural Experiment Station, St. Paul, Minn., and Fulgrain was bred by the Coker's Pedigreed Seed Co., Hartsville, S. C.

Disease-Resistant Oat Varieties

Group and variety	Resistant to	Agronomic characters	Adaptation	Remarks
<u>New Varieties</u>				
<u>Early common:</u> Boone /1	Stem rust, crown rust, and smut	High yield and quality	Corn belt	Also has some resistance to root rot and is heat tolerant Similar to Markton
Carleton	Smuts	do.	Pacific Northwest States	-----
<u>Early red:</u> Fulton	do.	do.	Kansas	-----
Fulgrain (winter)	do.	High yield and quality stiff straw	Southeastern States	A more typical red oat than Fulghum
<u>Midseason common:</u> Bannock	do.	High yield white grain	Southern Idaho and other irrigated sections of Western Intermountain States Northern Corn Belt	-----
Marion /1	Stem rust and smut	High yield; excellent quality; stiff straw		Also has resistance to some races of crown rust. Suitable for combining over a stand of sweet clover.
Hancock /1	do.	High yield and quality; very stiff straw	do.	
<u>Standard Varieties</u>				
<u>Early common:</u> Iogold	Stem rust	High yield and quality; stiff straw	Corn Belt primarily	Plumper grain than Richland
Richland	do.	High yield and quality; short straw	do.	Suitable for low, rich soils
<u>Midseason common:</u> Anthony	Stem rust	High yield and quality	Minnesota and North Dakota	-----
Markton	Smuts	do.	Western Intermountain and Pacific Northwest States	A very productive oat where rust is not a factor

/1 These are being increased for distribution to farmers of Iowa in the spring of 1940.



RADIO

Those who have occasion to broadcast over the radio will find the mimeographed "Radio Handbook for Extension Workers," by John Baker, radio extension specialist, Office of Information and Extension Service, U. S. Department of Agriculture, an invaluable aid in doing a good job.

